
REMARKS

Objection to drawings

FIGs. 1A, 1B, and 2-5 were objected to as not having been designated with a legend such as -- Prior Art --. Applicant has submitted substitute drawings in which these figures are labeled as such, and therefore requests that the objection to the drawings be withdrawn.

Claim rejections under 35 USC 103

Claims 1-6 and 8-13 have been rejected under 35 USC 103(a) as being unpatentable over Chang (6,197,481) in view of admitted prior art in the background section of the filed patent application. Applicant respectfully traverses this rejection. Applicant specifically argues the patentability of claims 1 and 11, which are independent claims from which the remaining pending claims ultimately depend, such that the remaining claims are patentable for at least the same reason that claims 1 and 11 are. Applicant also specifically argues the patentability of dependent claims 9 and 10, regardless of the patentability of claim 1 from which claims 9 and 10 depend.

First independent reason why claims 1 and 11 are patentable

Applicant has amended claims 1 and 11 so that the method exposes a field using a full-image mask, "such that the field, including the alignment mark thereon, is entirely exposed by an image of the mask." Applicant has made this amendment to make clearer what is meant by a full-image mask. Applicant asserts that such a full-image mask is not taught or disclosed by Chang in view of the admitted prior art.

The Examiner relies on the admitted prior art in the background section of the filed patent application as teaching or disclosing a full-image mask. Applicant disagrees. The entirety of the background section discusses the utilization of a *partial-image* mask 402, not a *full-image* mask, as to which the claimed invention is limited.

More particularly, the specification of the patent application as filed, in its discussion of FIG. 7, notes that "[t]he entire field 307 is thus exposed," where "[t]he full-image mask 702 corresponds to one or more semiconductor devices for the entire field 304, even the area in which the alignment mark 308 is located." Furthermore, "[t]his is as compared to the partial-image mask 402 of FIG. 4, in which there are semiconductor device(s) for only the bottom part of the field 304, not the top part of the field 304 that includes the alignment mark 308." And as described in the background section of the filed patent application, "[t]he top part of the mask 402 prevents exposure of the top part of the field 304 that has the alignment mark[, whereas] [t]he bottom part of the mask 402 includes a partial image for the field 304, such that the bottom part of the field 304 is exposed."

Therefore, Chang in view of the admitted prior art does not teach or disclose utilization of a full-image mask. The admitted prior art in particular discloses only a partial-image mask, not a full-image mask. Applicant notes that this difference is crucial, as it provides the claimed invention with advantages over the prior art. As noted in the second paragraph of the summary section of the patent application as filed, "[b]ecause the entire field is exposed, and not just a part of the field as is done in the conventional partial image exposure process, the semiconductor devices fabricated using the invention have greater planar uniformity as compared to the conventional process." Claims 1 and 11 are thus not rendered obvious over Chang in view of the admitted prior art.

Second independent reason why claims 1 and 11 are patentable

Applicant has amended claims 1 and 11 so that the method's performance of a clear out process is limited to "exposing just the alignment mark on the field." Applicant has made this amendment to make clearer what is meant by a clear out process. Applicant asserts that such a clear out process is not taught or disclosed by Chang in view of the admitted prior art.

The Examiner relies on column 3, lines 34-36 of Chang to read on the clear out process of the claimed invention. These lines of Chang, however, indicate that "[a]fter wafer processing

all remaining photoresist is removed producing bare alignment marks 12 ready for the next step of process steps.” By comparison, the amended claims limit the clear out process to exposing just the alignment mark on the field, not removing “all remaining photoresist,” as to which Chang in view of the admitted prior art teach. That is, Applicant asserts that Chang’s removal of photoresist is in fact not a clear out process as much as it is a photoresist strip process. By better defining in the claims what a clear out process is, Applicant has patentably distinguished the claimed invention from Chang in view of the admitted prior art. Therefore, claims 1 and 11 are not rendered obvious over Chang in view of the admitted prior art.

Third independent reason why claims 1 and 11 are patentable

Applicant has further amended claims 1 and 11 so that the method’s performance of a clear out process is limited to “using an auxiliary mask.” Applicant has also made this amendment to make clearer what is meant by a clear out process. Applicant again asserts that such a clear out process is not taught or disclosed by Chang in view of the admitted prior art.

Column 3, lines 34-36 of Chang do not teach, disclose, or suggest using an auxiliary mask to perform a clear out process. In these lines of Chang, all photoresist is removed, as has been described. Therefore, an auxiliary mask would never been needed, as a mask is used to block some parts of the wafer field, and allow other parts of the wafer field to be exposed. Using an auxiliary mask, then, is counter-intuitive to what Chang in view of the admitted prior art teach and disclose. Therefore, claims 1 and 11 are not rendered obvious over Chang in view of the admitted prior art.

Patentability of claims 9 and 10 independent of patentability of claim 1

Applicant asserts that claims 9 and 10 are independently patentable. Claims 9 and 10 are dependent claims off of claim 1, and are limited to “removing the photoresist that was unexposed.” The Examiner has relied upon column 3, lines 59-61 of Chang in finding this aspect of the claimed invention within the prior art. However, Applicant submits that the

Examiner has improperly used this same single step performed in Chang in view of the admitted prior art to read on two different limitations of the claimed invention: both the clear out process performance and the photoresist removal. That is, Applicant performs two steps or acts: clear out, and then photoresist removal, whereas Chang performs only one step: photoresist removal. Therefore, Chang in view of the admitted prior art cannot render the claimed invention obvious, as is now more particularly described.

With respect to claim 1, the Examiner has argued that lines 34-36 of column 3 of Chang read on the clear out process of the claimed invention. With respect to claims 9-10, the Examiner then argues that lines 59-61 of column 3 of Chang read on the photoresist removal process of the claimed invention. However, lines 34-36 and lines 59-61 of column 3 of Chang describe the same process step! In particular, lines 34-36 describe the process as to FIG. 1, such that "all remaining photoresist is removed producing bare alignment marks 12 ready for the next set of process steps." Lines 59-61 describe the same process as to FIG. 2, such that "all photoresist is removed from the surface of the wafer 37 and the processing of the wafer continues 38." These are the same process step – lines 34-36 describe the step in relation to the wafer diagram of FIG. 1, whereas lines 59-61 describe the step in relation to the method flowchart of FIG. 2.

Therefore, this means that Chang in view of the admitted prior art do not read on the invention of claims 9 and 10. If lines 34-36, 59-61 of column 3 of Chang correspond to the clear out process of the claimed invention (which Applicant does not admit), then these same lines cannot correspond to the photoresist removal process of the claimed invention, which is a separate step or act performed in addition to the clear out process. The reverse is also true. If lines 34-36 and 59-61 correspond to the photoresist removal process of the claimed invention, then they cannot correspond to the clear out process of the claimed invention.

That is, the invention of claims 9 and 10 is limited to three steps or acts: field exposure, clear out process performance, and photoresist removal. The Examiner has relied on the same step performed once in Chang as reading on both the clear out process and the photoresist

removal steps or acts. However, this is improper. If the step performed in Chang reads on clear out, it cannot also read on photoresist removal, and vice-versa. Therefore, claims 9 and 10 are patentable over Chang in view of the admitted prior art. All element (i.e., steps or acts) of the claimed invention must be found in Chang in view of the admitted prior art, and they are not.

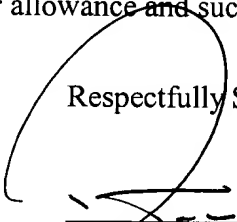
Claims 7, 14, and 15

Claims 7, 14, and 15 have been rejected under 35 USC 103(a) as being unpatentable over Chang in view of the admitted prior art, and further in view of Wolf. Because claims 7, 14, and 15 are dependent claims depending ultimately from independent claims 1 and 11, however, these claims are patentable for at least the same reasons that claims 1 and 11 are patentable, as have already been discussed.

Conclusion

Applicant has made a diligent effort to place the pending claims in condition for allowance, and request that they so be allowed. The Commissioner is hereby authorized to charge Deposit Account No. 50-0484 any fee which may be due as a result of this amendment. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Randy Tung, Applicant's Attorney, at 248-540-4040, so that such issues may be resolved as expeditiously as possible. For these reasons, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Respectfully Submitted,



Randy Tung (31,311)

PRIOR ART

FIG 1A

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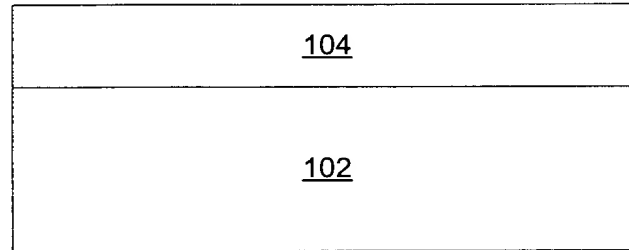


FIG 1B

PRIOR ART

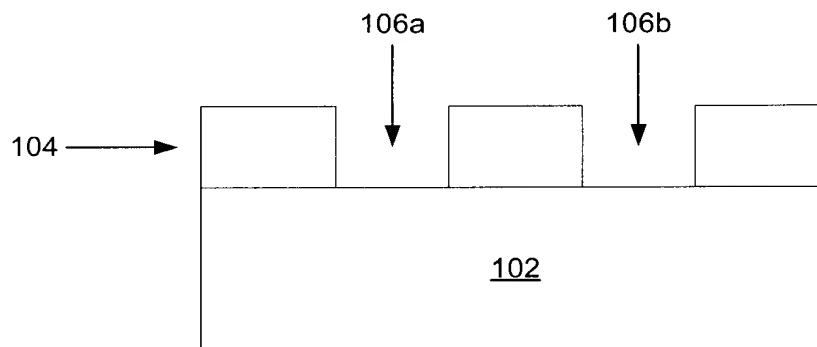


FIG 2

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PRIOR ART

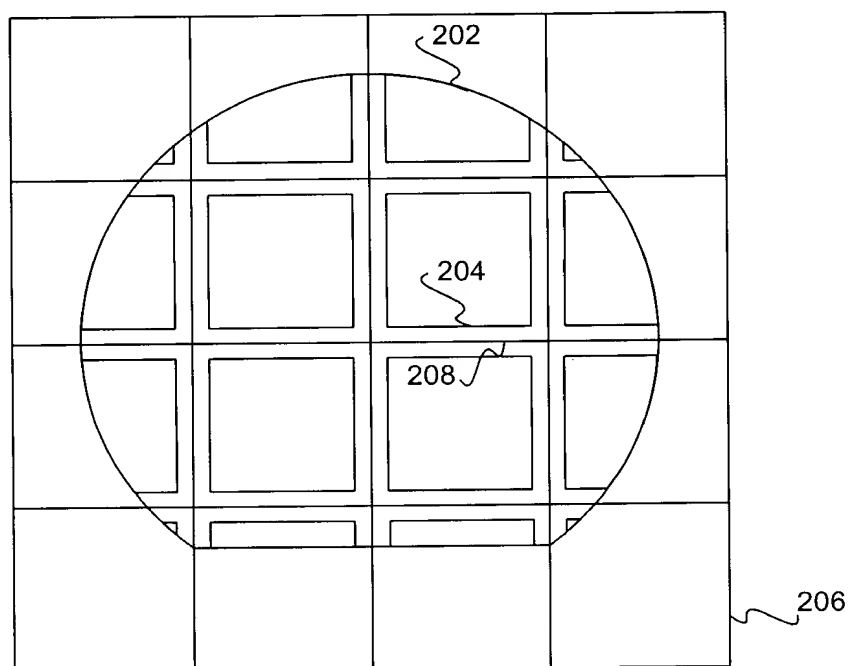


FIG 3

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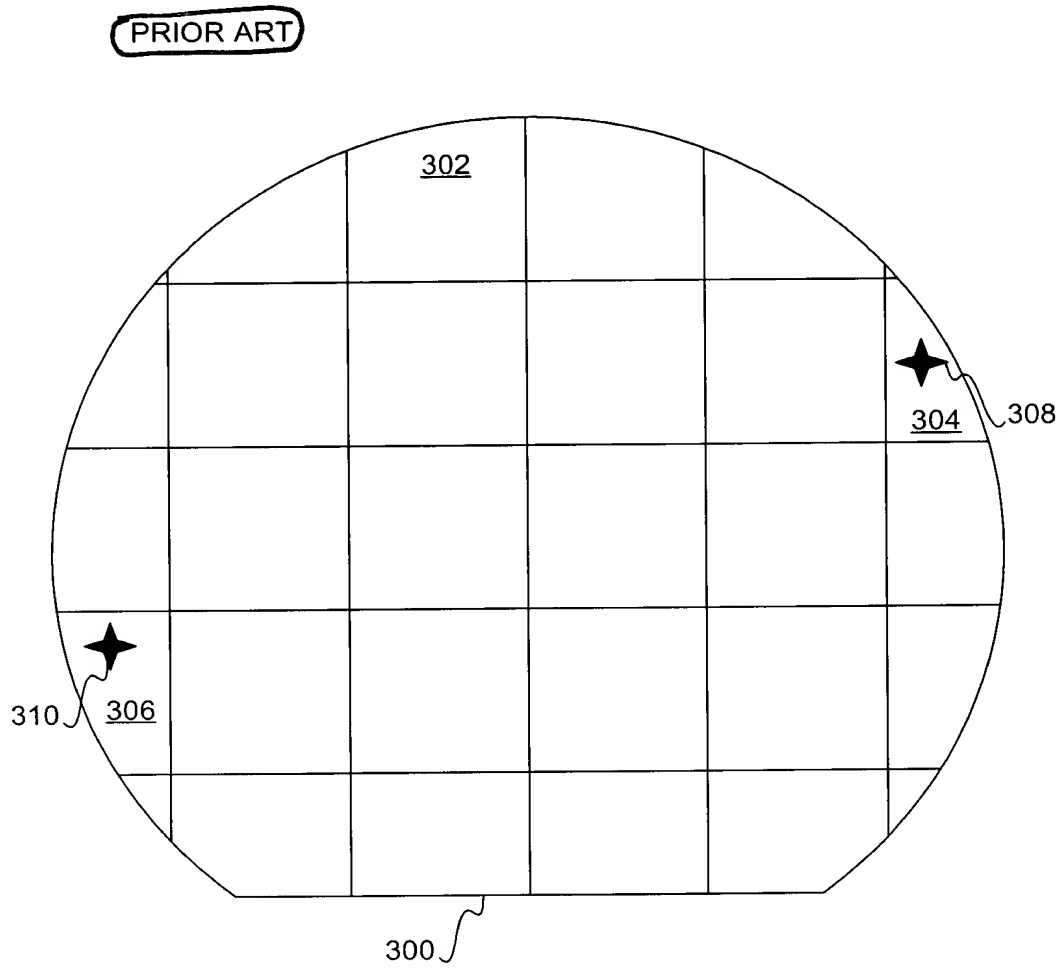


FIG 4

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PRIOR ART

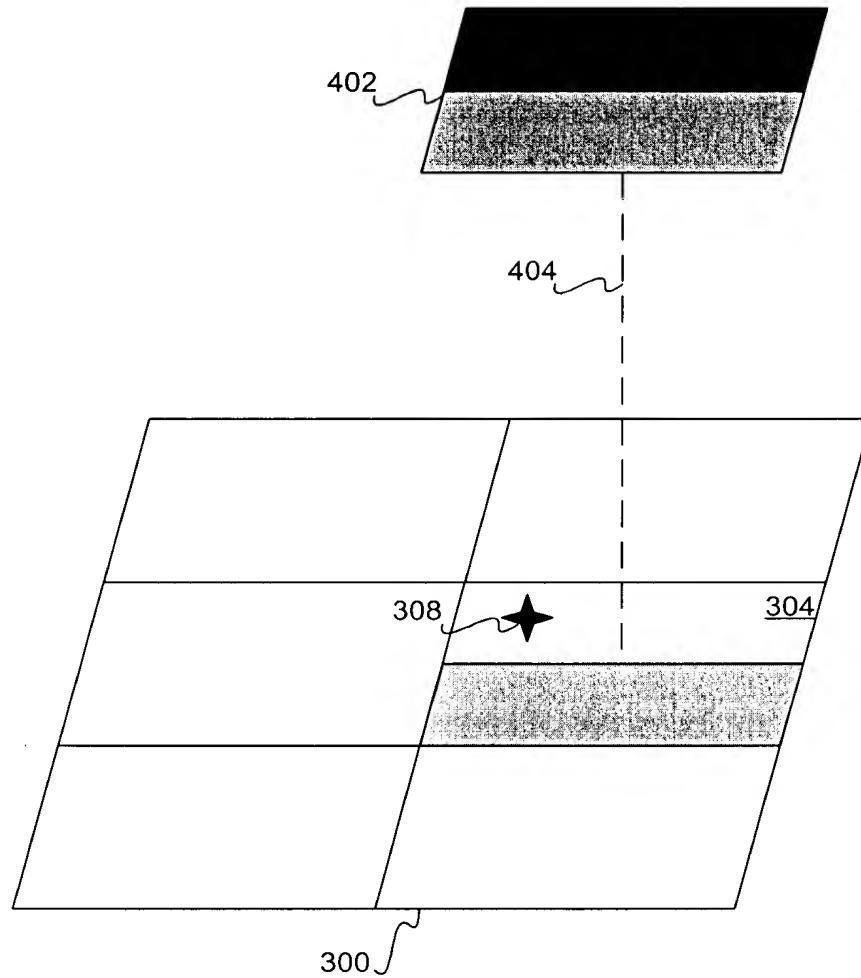


FIG 5

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PRIOR ART

